

SEQUENCE LISTING

GENERAL INFORMATION

<110> APPLICANT: The Regents of the University of California

Saltveit, Mikal

Campos, Reinaldo

Nonogaki, Hiroyuki

Suslow, Trevor



<120> TITLE OF INVENTION: Characteristics of Phenylalanine Ammonia-lyase (PAL) Gene in Wounded Lettuce Tissue

<130> FILE REFERENCE: UCDA.004.01US

<140> CURRENT APPLICATION NUMBER: 09/964,992

<141> CURRENT FILING DATE: 2001-09-26

CORRESPONDENCE ADDRESS:

ADDRESSEE: Rae-Venter Law Group, P.C.

STREET: 260 Sheridan Ave., Suite 440, P.O. BOX 60039

CITY: Palo Alto

STATE: CA

COUNTRY: US

ZIP CODE: 94306

ATTORNEY/AGENT INFORMATION:

NAME: Rae-Venter, Barbara

REGISTRATION NUMBER: 32,750

TELECOMMUNICATION INFORMATION:

TELEPHONE: 650-328-4400

TELEFAX: 650-328-4477

+ 160% NUMBER OF SEQ ID NOS: 5

· 170 · SOFTWARE: Patentin version 3.0

+ 210 + SEQ ID NO: 1

· 211 · LENGTH 711

- 212 - TYPE: PRT

- 213 - ORGANISM: Lactuca sativa

≤400≥ SEQUENCE 1

- Met Glu Asn Gly Asn His Val Asn Gly Val Val Asn His Leu Cys Ile 1 5 10 15
- Lys Asp Pro Leu Asn Trp Gly Val Ala Ala Glu Ala Leu Thr Gly Ser 20 25 30
- His Leu Asp 3lu Val Lys Lys Met Val Ala Glu Phe Arg Lys Pro Val 35 40
- Val Lys Leu Gly Gly Glu Thr Leu Thr Val Ser Gln Val Ala Gly Ile 50 $\,$ 55 $\,$
- Ala Ala Ala Asn Asp Ser Asp Thr Val Lys Val Glu Leu Ser Glu Ala 65 70 75 80
- Ala Arg Ala Gly Val Lys Ala Ser Ser Asp Trp Val Met Glu Ser Met 85 90 95
- Asn Lys Gly Thr Asp Ser Tyr Gly Val Thr Thr Gly Fhe Gly Ala Thr 100 \$105\$
- Ser His Arg Arg Thr Lys Gln Gly Gly Ala Leu Gln Lys Glu Leu Ile 115 120 125
- Arg Phe Leu Asn Ala Gly Ile Phe Gly Asn Gly Thr Glu Thr Ser His 130 $$135\$
- Thr Leu Pro His Ser Ala Thr Arg Ala Ala Met Ile Val Arg Ile Asn 145 150 155 160
- Thr Leu Leu Gln Gly Tyr Ser Gly Ile Arg Phe Gln Ile Leu Glu Ala 165 \$170\$
- The Thr Lys Phe Leu Ash Ash Ile Thr Pro Cys Lett Pro Leu Arg 180 185 190
- Gly Thr Ile Thr Ala Ser Gly Asp Leu Val Pro Leu Ser Tyr Ile Ala 195 - 200 - 25
- Sly Leu Leu Thr Gly Arg Pro Asn Ser Lys Ala Val Gly Pro Thr Gly 215 22
- Slu Val Leu Asn Ala Slu Lys Ala Phe Ala Ala Ala Sly Val Slu Sly 230 235 240
- Hy The Phe Giu Leu 31h Pro Lys Glu Sly Leu Ala Leu Val Ash Hy 245 255
- Thr Ala Val Bly Ser Jly Met Ala Ser Met Val Le. The Asp Ala Ash
- Val 189 Ala 189 189 Ser 319 Val 189 Ser Ala 119 Eng Ala 319 Val 189

Met	Gln 290	Gly	Lys	Pro	Glu	Phe 295	Thr	Asp	His	Leu	Thr	His	Lys	Leu	Lys
His 305	His	Pro	Gly	Gln	Ile 310	Glu	Ala	Ala	Ala	Ile 315	Met	Glu	Tyr	Ile	Leu 320
Asp	Gly	Ser	Asp	Tyr 325	Val	Lys	Ala	Ala	Gln 330	Lys	Val	His	Glu	Met 335	Asp
Pro	Leu	Gln	Lys 340	Pro	Lys	Gln	Asp	Arg 345	Tyr	Ala	Leu	Arg	Thr 350	Ser	Pro
Gln	Trp	Leu 355	Gly	Pro	Gln	Ile	Glu 360	Val	Ile	Arg	Ser	Ser 365	Thr	Lys	Met
Ile	Glu 370	Arg	Glu	Ile	Asn	Ser 375	Val	Asn	Asp	Asn	Pro 380	Leu	Ile	Asp	Val
Ser 385	Arg	Asn	Lys	Ala	Leu 390	His	Зly	Gly	Asn	Phe 395	Gln	Gly	Thr	Pro	Ile 400
Gly	Val	Ser	Met	Asp 405	Asn	Thr	Arg	Leu	Ala 410	Ile	Ala	Ala	Ile	Gly 415	Lys
Leu	Met	Phe	Ala 420	Gln	Phe	Ser	Glu	Leu 425	Val	Asn	Asp	Phe	Tyr 430	Asn	Asn
Gly	Leu	Pro 435	Ser	Asn	Leu	Ser	Gly 440	Gly	Arg	Asn	Pro	Ser 445	Leu	Asp	Tyr
Gly	Phe 450	Lys	Gly	Gly	Glu	Ile 455	Ala	Mes	Ala	Ser	Ty: 460	Cys	Ser	Glu	Leu
J1:. 465	Fhe	Leu	A.a	Asn	Pro 470	Val	Thr	Asn	His	Val 475	Gln	Ser	Ala	Glu	Gln 480
His	Asn	Gln	Asp	Val 485	Asn	Ser	Leu	Glγ	Leu 490	Ile	Ser	Ala	Arg	Lys 495	Thr
Ala	Glu	Ala	Val 510	Asp	Ile	Leu	Lys	Leu 505	Met	Ser	Ser	Thr	Tyr 510	Leu	Val
Ala	Leu	Tys 515	31n	Ser	Tle	Asp	Leu 520	Arg	His	Leu	514	Glu 525	Asn	Met	Lys
Ser	Thr 530	Val	Lys	Asn	Thr	Val 535	Ser	Jln	Val	Ala	Lys 540	Lys	Val	Leu	Thr
Мер 546	Sly	Val	Asn	Зlу	31u 550	Leu	His	Pro	Ser	Arg 555	Phe	Cys	314	Lys	Asp 560
Leu	Leu	Arg	Val	Val 565	Asp	Arg	Glu	Tyr	Val 570	Phe	Ala	Tyr	Ile	Asp 575	Asp
Val	Ņs	Ser	31y 590	Thr	Tyr	Fro	Leu	Met 545	Яlп	Lys	Len	Arg	31n 590	Val	Leu
	Asp	His	Ala	::4::	Asn	Asn	Пy	Hu	Thr	ilu	Lys	Asn	Thr	Asn	Thir

595 600 605

Ser Ile Phe Gln Lys Ile Ala Thr Phe Glu Glu Glu Leu Lys Val Leu 610 620

Leu Pro Lys Glu Val Glu Gly Val Arg Ile Ala Tyr Glu Asn Asp Thr 625 630 635 640

Leu Ser Ile Pro Asn Arg Ile Lys Ala Cys Arg Ser Tyr Pro Leu Tyr 645 650 655

Arg Phe Val Arg Glu Glu Leu Gly Arg Gly Phe Leu Thr Gly Glu Lys 660 665 670

Val Thr Ser Pro Gly Glu Glu Phe Asp Arg Val Phe Thr Ala Met Cys 675 680 685

Lys Gly Gln Ile Ile Asp Pro Leu Leu Glu Cys Leu Gly Gly Trp Asn 690 695 700

Gly Glu Pro Leu Pro Ile Cys 705 710

- <210> SEQUENCE ID NO: 2
- <2115 LENGTH: 712
- <212 TYPE: PRT
- <213> ORGANISM: Lactuca sativa
- <400> SEQUENCE 2

Met Gly Ser Thr Glu Met Glu Val Asp Ser His Gln Asn Gly Glu Arg

Ala Glu Phe Cys Val Gly Asp Pro Leu Asn Trp Gly Met Ala Ala Glu 20 25 30

Ser Leu Lys Gly Ser His Leu Asp Glu Val Lys Arg Met Val Ala Glu 35 40 45

Fine Arg Lys Fro Val Val Arg Leu Gly Gly Glu Thr Leu Thr Val Ser 50 50 51

Gin Val Ala Ala Ile Ala Ala Ser Asp Ash Ala Gly Val Lys Val Glu

Led Ser Jlu Thr Ala Arg Ala Gly Val Lys Ala Ser Ser Asp Trp Val

Met Glu Ser Met Ash Lys Gly Thr Asp Ser Tyr Gly Val Thr Thr Gly

The Sly Ala Thr Ser His Arg Arg Thr Lys Glu Sly Sly Ala Leu Hin

Lys 31% Lew Tie Ang The Lew Ash Ala Siy Tie The Riy Ash Siy Thr

	1.30					135					140				
Glu 145	Ser	Thr	His	Thr	Leu 150	Pro	His	Ser	Ala	Thr 155	Arg	Ala	Ala	Met	Leu 160
Val	Arg	Ile	Asr.	Thr 165	Leu	Leu	Gln	Gly	Туг 170	Ser	Gly	Ile	Arg	Phe 175	Glu
Ile	Leu	Glu	Ala 180	Ile	Thr	Lys	Phe	Leu 185	Asn	His	Asn	Val	Thr 190	Pro	Phe
Leu	Pro	Leu 195	Arg	Gly	Thr	Ile	Thr 200	Ala	Ser	Gly	Asp	Leu 205	Val	Pro	Leu
Ser	Tyr 210	.le	Ala	Gly	Leu	Leu 215	Thr	Gly	Arg	Ala	Asn 220	Ser	Lys	Ala	Val
Gly 225	Pro	Thr	Gly	Glu	Val 230	Leu	Asn	Ala	Glu	Lys 235	Ala	Phe	Ala	Glu	Ala 240
Gly	Val	Glu	Gly	Gly 245	Phe	Phe	Glu	Leu	Gln 250	Pro	Lys	Glu	Gly	Leu 255	Ala
Leu	Val	Asn	Gly 260	Thr	Ala	Val	Gly	Ser 265	Gly	Met	Alā	Ser	Met 270	Val	Leu
Phe	Asp	Ala 275	Asn	Val	Leu	Ala	Leu 280	Leu	Ser	Glu	Val	Leu 285	Ser	Ala	lle
Phe	Ala 290	Glu	Val	Met	Gln	Gly 295	Lys	Pro	Glu	Phe	Thr 300	Asp	His	Leu	Thr
Hīs 3.5	Lys	Leu	Lys	His	His	Pro	Gly	Gln	Ile	Glu 315	Ala	Ala	Ala	Ile	Met 320
Glu	Tyr	Tle	Leu	Asp 325	Gly	Ser	Asp	Tyr	Val 330	Lys	Ala	Ala	Gln	Lys 335	11-1
His	Glu	Met	Asp 340	Pro	Leu	Gln	Lys	Pro 345	Lys	Gln	Asp	Ar'g	Tyr 350	Ala	ben:
Arg	Thr	Ser 355	Pro	Gln	Trp	Leu	31y 360	Pro	Gln	Ile	Glu	Val 365	Ile	Arg	Ser
Ser	Thr 370	Lys	Met	Ile	Glu	Arg 375	Glu	Ile	Asn	Ser	V41 331	Asn	Asp	Asn	Fro
Leu Pas	Ile	Asp	Val	Ser	Arg 390	Asn	Lys	Ala	Leu	His 395		Эlү	Asn	Phe	31n 400
T.y		ira		11y 405	Val	Ser	Mat	Asp	As:: 410		At q	len	Alä	Ile 415	Ala
Ali	Tie	Gly	Lys 423	Len	Met	Fhe	Ala	31n 425	Phe	Ser	#lu	Len	Val 4∃	Asr.	Asp
î î.,	Ty:	Asn 435	Aen	чу	Leu	Fr	Ser 440	Asn	le".	Sei	ЗЭ	11.y 445	Arsi	ÀSI.	i:

Ser Leu Asp Tyr Gly Phe Lys Gly Ala Glu Ile Ala Met Ala Ser Tyr Cys Ser Glu Leu Gln Phe Leu Ala Asn Pro Val Thr Asn His Val Gln Ser Ala Glu Gln His Asn Gln Asp Val Asn Ser Leu Gly Leu Ile Ser 490 Ala Arg Lys Thr Ala Glu Ser Val Glu Ile Leu Lys Leu Met Ser Thr Thr Tyr Leu Val Ala Leu Cys Gln Ser Ile Asp Leu Arg His Leu Glu 520 Glu Ash Leu Lys Ser Thr Val Lys Ash Thr Val Ser Leu Val Ala Lys 535 Lys Ile Leu Thr Thr Gly Val Asn Gly Glu Leu His Pro Ser Arg Phe 550 555 Cys Glu Lys Asp Leu Leu Arg Val Val Asp Arg Glu Tyr Val Phe Ala 565 570 Tyr Ile Asp Asp Ala Cys Ser Ala Thr Tyr Pro Leu Met Gln Lys Leu 585 Arg Gln Val Ile Val Asp His Ala Leu Asn Asn Glu Asn Asp Ala Gly 600 Thr Ser Ile Phe Gln Lys Ile Ser Glu Phe Glu Glu Glu Leu Lys Ala 615 Val Len Pro Lys Glu Val Glu Gly Val Arg Ser Ala Tyr Glu Ser Ser 630 635 Thr Leu Thr Ile Pro Asn Arg Ile Lys Glu Cys Arg Ser Tyr Pro Leu 650 Tyr Arg Fne Val Arg Glu Glu Leu Gly Thr Gly Phe Leu Thr Gly Glu 665 31d Val Thr Ser Pro 31y 31u 31u Phe Asp Lys Val Fhe Thr Ala Leu lys Lys Bly His Ile Ile Asp Pro Leu Leu Glu Dys Val Gln Gly Trp

710

Ash Gly Val Pro Leu Pro Ile Ser

- 210 - SEQ ID NO 3

+211+LENGTH 2442

+ 212 - TYPE cDNA

<213> ORGANISM: Lactuca sativa

+ 400 + SEQUENCE 3

150055566	a+ -a==+====	attoacocac	aaadadtata	agraragrar	grgaagaagr	60
	atcaataccc					
acacaattag	attgttottg	tttctttgat	ctatagtota	caatotgtat	aaataataat	120
ggagaacggt	aatcacgtta	atggagtegt	taatgagttg	tgsätsaagg	atocattgha	151
otggggagtt	gcagoggagg	cgttgaccgg	aagtoacott	gatgaggtga	agaagatggt.	24 [
tgoggagtto	agasagoogg	tggtgaagst	cggaggagag	acgottacag	tttctcaggt	300
ggoggggato	gragotycta	atgacagtga	caccgtgaag	gtggagstgt	oggaagoogo	360
gagggetgga	gttaaggoga	gtagtgattg	ggttatggag	agratgaata	aaggaactga	4.25
tagttatggt	gtdaccaccg	gattoggaga	caccicicac	oggagaacta	agcaaggogg	4.80
tootttacag	aaggagstsa	ttagattttt	gaadgoogga	atattoggda	atggaacgga	540
aaraagotao	acacttopac	attcagccad	cagagoogoo	atgatogtca	gaatcaacac	600
retectocag	ggttactccg	goatcogatt	ogagatottg	gaagccatca	ddaagttddt	660
taacaacaac	ateacecett	gtttacccct	cogtggaacc	atbacogoct	coggtgacct	720
tgttesatta	toatacatog	aaggaatatt	aaccggcogo	godaadtoda	aagcogttgg	780
deneacegga	gaagtootoa	atgoogaaaa	ggaattagat	gdagddggag	ttgaaggtgg	840
gtt "ttggag	ttaragooga	aagaagggot	ägcasttgtt	aacggcabcg	sagtggggt .	900
ngggatgdct	tocatograd	tatttgatgr	rantisanst	acarrarras	dåäsedtäm.	960
atnggngatb	ttegetjägg	ttatgmaagg	gaagooggag	tttanngatn	acttqanach	152.
Hasttgaag	nat macroty	gtcaaatuga	ggaggaggag	atzatggagt	atattttgg:	1041
паравартат	tangthaagg	nggnghasas	ggt changaa	atggattngt	tacagaadun	1141
asaacaagat	ggttatgit:	toogtacat:	tobocaatgg	otögganotő	aaatogaagt	1200
Gat dogatica	traatraass	tgatogagad	ggaaattaat	ะบาสบาล เกล	acaachni.	12.**
gat gacatt	; cpagnakba	aagotrtāca	'वेव्हरवृत्ता प्रवेती	िहर । भवपुर्वे व	2222 aan 14 a	132.
atti vita	galita "Gilo"	ulistogonat	tg rtg radt s	ддавааст, га	tgttnggtna	1345
irrot ot tag	rrpgttaalg	ittttatacai	maatggatta	ncatngaato	tatanggtga	1440
and and ord	agttidgast	រប្មវិធីធីរ ជា មេ	ндагдандан	ativak ratga	ittottain (7.4
tem alighth	Magttfotoa	maaat magt	าสุก สุงสูกลู้	কুং ভাৰৰণকৈ	าฮสูลลาลลาง	7.5%
11 11 11 11	11. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	adatzifa.	143 13 433	1741	स्त्रवृत्ताः व्या	12.

catcttaaaa ctcatgtogt cgacatactt agtcgctcta tgccaatcoa tcgatttacg 1580 1743 coattiggaa gagaacatga aatogacagt gaagaacaco gtaagocaag togogaaaaa ggtootback atgggogtba acggogaget beaccepteg agattotgbg agaaagatot 1300 colocoglight gitigatogicy aatacgitoit ogottacato gacgacgitti goagciggoac 1360 atacocatta atgoagaago toogacaygt totggtogao babgototaa abaacygoga 1920 aacggagaag aacastaaca octocatott ocaaaaajato gotacottog aagaagaast 1980 2040 gaaagtootg ttacogaaag aagttgaagg tgttagaato gottatgaga atgatacatt gtogattoca aacaggatta aagottgoag atogtacoog tigitataggi tigitaaggga 2100 ggagetegge agagggtitt ttgaceggaga aaaggtgaeg tegeegggag aggagttega 2160 2220 cagggtgttc acggcgatgt gcaaaggtca aattattgat ccgttgttgg agtgtcttgg 2280 agggtggaat ggggaacctc ttccaatatg ttaggaaagt gagtgtgaaa ccgtttgaat 2.341. egeateegta atactotigen tetetetetet tenettaaan tetattetgoa tetaatatoti 1400 calcalaagad ticcactitic aagigtggig taigtggitt taaatcatat atattaacti 2442 attatttttg ctaaaaaaaa aaaaaaaaaa aa

<210> SEQ ID NO: 4

<211> LENGTH: 2380

~212> TYPE_cDNA

~213> ÖRGANISM: Lactuca sativa

<400> SEQUENCE 4

graginating chartteach adotteaate defeatteth tetetotaaa aaaachagad t ingtaatit intgataatgy goagrabaga aatggaygtt yabagmmati aaaacggiya. 130 gagagnygag titiqtgtg: aaggggatoo titigaantg; jggatggnyg ojgagtoatt 240 aaaggqtagt catttagicj aggtgiagcg gatggtggcg gagtttagga agcoggtggt 300 gagattgggt ggagagatgt tgactgtgtc gbaggtggcg gmgattgmog mbagtgataa ng ntgqqqtq aaggtggaad tqtoggagad ggdgaggdd ggggtgaagg ogagtagtga 350 thorghnate gagagtatea ataaaggaad gestaentah eetesta coegettoeg 4.30 450 ig tamotot cassagagaa ogaaagaagg togttottt cagaaggago toattagatt ittigas ighir baaatattiig gtbatggtar agaatisaami isasa hattto savattidagi. 540

cacaagagca	gccatgcttg	tcagaatcaa	caccctcctt	caaggttact	coggoatoog	500
attcgagatc	ttggaggcga	tcaccaagtt	cctcaaccac	aacgtcaccc	cttttctccc	55)
totoogtggg	acaattaccg	cotooggoga	totogtosca	ttatostaca	togeoggtet	72.)
teteacegge	cgtgccaact	ccaaagccgt	tggacccacc	ggagaagttc	taaatgooga	13)
aaaggccttc	gcggaagccg	gagttgaagg	tggtttatta	gagttacagc	ogaaagaagg	84.1
gstagsastt	gtcaacggca	dagaagtiggg	atcogggatg	gogtogatgg	tgotatttga	*) }
tgstaatgtt	sttgcattgt	tgtcggaagt	gttatoggog	atottogotg	aagttatgca	ije, i
aggtaagccg	gagtttactg	atcasttaas	avacaaattg	aagcatcacc	coggtoaaat	102.
cgaggcggcg	gcgatcatgg	agtatatttt	ggacggaagc	gattaogtoa	аддоддод за	1 () A .
aaaggtocac	gaaatggacc	ogttacagaa	арраавараа	gatogttatg	ctotoogtac	114
atotococaa	tggstsggas	otoaaatoga	agtaatooga	toatoaacca	aaatgatoga	1200
gagagaaatt	aactoogtoa	acgadaacci	attgatogao	gtttccagaa	acaaagtett	1266
acaeggtgge	aacttccaag	gaaccccaat	oggagtttoc	atggataaca	caegtttgge	1920
gatogoogoo	atoggaaago	taatgttcgc	teagttetet	gagottgtca	acgattttta	1380
савсвасддд	ttgccatcca	atototoogg	oggooggaat	ocaaghttgg	attacgggtt	144%
raaaggtgca	gaaatogooa	tggettetta	etgetetgag	otucagnits	togodaatod	15.5
agtcacaaac	cacqttcaaa	gogoogaaca	adadaaccaa	gatgttaatt	octigggait	1560
gatttcagca	agaaaaacag	cagaatcagt	ogagatotta	aaactwatgt	рааррајата	16
attagtaget	Statgtdaat	dicatiogastt	gaggoatittg	gaagagaacc	tgaaat bosc	163
agtgaagaac	acagogagoo	togtogogaa	gaagatoota	яррафордор	tiaatgyoga	1740
geteradaet	totogottot	gogagaaaga	attgattagt	gtggtogaca	gggagtatgt	1800
otttgcatac	atogacgacg	ottgoagogo	cacctacica	ttgatgcaga	agotoqgana	1867
ggttatcgtc	gaccacgcat	taaacaacga	aaatgazici	ggaacttcca	tottocaasa	1920
gal. Nagtona	tingaagagg	asctgaasgo	ogititgina	авыдчыдт дд	aggagttag	1945
aagtocatao	jagigtt∷ja	cattgacgat	tocaaacagg	atcaaggagt	gtagatsata	2040
oppattglac	aggittigiga	gagaggaget	tggaagaggg	tttttgacag	gggaggaggt	2100
gacgtracct	ggagaagagt	togataaggt	gttpactgct	ttgtgmaaag	gacatattat	2160
ngat nhat tig	ttggagtgtg	ttcaagggtg	gaatggtgtt	ant et tierga	tttna ayrr	2.22
	. Yahractts	ttatgagitt	tanggattt	ghaadhagaa	antothat in	2249

		•													
caa	at yt	gta	tgta	attg	ta a	tgta	ctat	t gt	atgt	ttgt	aat	tgta	cca	cgtta	aagtgt
acc'	accttttgtt teataaaaaa aaaaaaaaaa aaaaaaaaaa														
< 210	<210> SEQ ID NO: 5														
<211> LENGTH: 666															
<212> TYPE: PRT															
<213> ORGANISM: Common Sunflower (Helianthus annuus)															
<400> SEQUENCE 5															
~ 1 ()()	> SEC	QUEN	CE 5												
Met 1	Glu	Asn	З1у	Thr 5	His	Val	Asn	Gly	Ser 10	Ala	Asn	Gly	Phe	Cys 15	Ile
Lys	Asp	Pro	Leu 20	Asn	Trp	Gly	Val	Ala 25	Ala	Glu	Ala	Leu	Thr 30	Gly	Ser
His	Leu	Asp 35	Glu	Val	Lys	Lys	Met 40	Val	Gly	Glu	Phe	Arg 45	Lys	Pro	Val
Val	Lys 50	Leu	Gly	Gly	Glu	Thr 55	Leu	Thr	Val	Ser	Gln 60	Val	Ala	Gly	Ile
Ser 65	Ala	Ala	Gly	Asp	Gly 70	Asn	Met	Val	Lys	Val 75	Glu	Leu	Ser	Glu	Ala 80
Ala	Arg	Ala	Gly	Val 85	Lys	Ala	Ser	Ser	Asp 90	Trp	Val	Met	Glu	3er 95	Met
Asn	Lys	Gly	Thr	Asp	Ser	Tyr	Gly	Val 105	Thr	Thr	Gly	Phe	Gly 110	Ala	Thr
Ser	His	Arg 115	Arg	Thr	Lys	Asn	Gly 120	Gly	Ala	Leu	Gln	Lys 125	Glu	Leu	Ile
Arg	Phe 130	Leu	Asn	Ala	Gly	Ile 135	Phe	Gly	Asn	Gly	Thr	Glu	Ser	Ser	His
Thir 145	Lag	Pro	His	Ser	Ala 150	Thr	Arg	Ala	Ala	Met 155	11e	Val	Arg	Ile	Asn 160
Thr	Leu	Leu	Gln	3ly 165	Tyr	Ser	Gly	Ile	Arg 170	Phe	Glu	Ile	Leu	Glu 175	Ala

lle Thr Lys Phe Leu Asn Asn Ile Thr Pro Cys Leu Pro Leu Arg

thy Thr Ile Thr Ala Ser Bly Asp Leu Val Frö Leu Ser Tyr Ile Ala

sly Leu Leu Thr Sly Arg Pro Asn Ser Lys Ala Val Sly Pro Ala Sly

sin Val Leu Asm Ala Glu Ser Ala the Ala Glm Ala Gly Val Glu Gly

195 200 205

213 215 221

2340

2380

225					230					235					24
Gly	Phe	Phe	Glu	Leu 245	Gln	Pro	Lys	Glu	Gly 250	Leu	Ala	Leu	Val	Asn 255	Gly
Thr	Ala	Val	Gly 260	Ser	Gly	Met	Ala	Ser 265	Met	Val	Leu	Phe	Glu 270	Ala	Asr
Val	Leu	Ala 275	Leu	Leu	Ser	Glu	Val 280	Leu	Ser	Ala	Ile	Phe 285	Ala	Glu	Val
Met	Gln 290	Gly	Lys	Pro	Glu	Phe 295	Thr	Asp	His	Leu	Thr 300	His	Lys	Leu	Lys
His 305	His	Pro	Gly	Gln	11e 310	Glu	Ala	Ala	Ala	Ile 315	Met	Glu	Tyr	Ile	Leu 320
Asp	Gly	Ser	Asp	Tyr 325	Val	Lys	Ala	Ala	Gln 330	Lys	Val	His	Glu	Met 335	Авр
Pro	Leu	Gln	Lys	Pro	Lys	Gln	Asp	Arg 345	Tyr	Ala	Leu	Arg	Thr 350	Ser	Fro
Gln	Trp	Leu 355	Gly	Pro	Gln	Ile	Glu 360	Val	Ile	Arg	Ser	Ala 365	Thr	Lys	M⊕t
Ile	Glu 370	Arg	Glu	Ile	Asn	Ser 375	Val	Asn	Asp	Asn	Pro 380	Leu	Ile	Asp-	Val
Ser 385	Arg	Asn	Lys	Ala	Leu 390	His	Gly	Gly	Asn	Phe 395	Gln	Gly	Thr	Pro	I.⊕ 4·□)
Gly	Val	Ser	Met	Asp 405	Asn	Thr	Arg	Leu	Ala 410	Ile	Ala	Ala	Ile	Gly 415	Lys
Val	Thr	Ile	Ala 420	Gln	Phe	Ser	Glu	Leu 425	Val	Asn	Asp	Phe	Ty: 430	Asr.	Asn
Зlу	Leu	Pro 435	Ser	His	Leu	Ser	31y 440	Gly	Arg	Asn	Pro	Ser 445	Leu	Asp	Ser
Jly	Phe 450	Lys	Gly	Gly		Ile 455		Met	Ala		Tyr 460		Ser	Glu	Leu
71 E	Phe	Leu	Ala	Asn	Pro 470	Val	Thr	Aşī.	His	Val 475	Gln	Ser	Ala	31:3	4.:
His	Asn	Gln	Asp	Val 485	Asn	Ser	Leu	Gly	Leu 490	Ile	Ser	Ala	Arg	Lys 495	Thi
Ala	310	Ala	Val 500	Asp	ile	Leu	Lys	Leu 505	Met	Ser	Ser	Thr	Tyr 510	Leu	Val
Ala	Leu	Cys	Gln	Ser	Ile	Asp	Leu 520	Arg	His	Leu	314	31a 525	Asn	Mer	Lys
: :	:: :::	Val	L/s	Asi.	71.1	V41 535	Ser	31::	Vil	Ais	Lys 54	Lys	∵al	Len	

Met 545	Gly	Val	Asn	Gly	Glu 550	Leu	His	Pro	Ser	Arg 555	Phe	Cys	Glu	Lys	Asp 560
Leu	Leu	Arg	Val	Val 565	Asp	Arg	Glu	Tyr	Val 570	Phe	Ala	Туз	Ala	Asp 575	Asp
Pro	Cys	Leu	Thr 580	Thr	Tyr	Pro	Leu	Met 585	Gln	Lys	Leu	Arg	Gln 590	Val	Leu
Val	Asp	His 595	Ala	Leu	Asn	Asn	Gly 600	Glu	Thr	Glu	Lys	Asn 605	Ala	Asn	Thr
Ser	Ile 610	Phe	Gln	Lys	Ile	Ala 615	Thr	Phe	Glu	Asp	Glu 620	Leu	Lys	Ala	ĭlė
Leu 625	Pro	Lys	Glu	Val	Glu 630	Ser	Val	Arg	Val	Ala 635	Phe	Glu	Asn	Gly	Thr 640
Met	Ser	Ile	Pro	Asn 645	Arg	Ile	Lys	Ala	Cys 650	Arg	Ser	Tyr	Pro	Leu 655	Tyr
Arg	Phe	Val	Arg 660	Glu	Glu	Leu	Gly	Gly 665	Ala						